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<110> Quip Technology Limited

<120> Retrovirus Assay

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<151> 2000-08-16

<160> 19

<170> PatentIn version 3.1

<210> 1

<211> 524

<212> PRT

<213> porcine endogenous retrovirus

<400> 1

Met Gly Gln Thr Val Thr Thr Pro Leu Ser Leu Thr Leu Asp His Trp
1 5 10 15

Thr Glu Val Arg Ser Arg Ala His Asn Leu Ser Val Gln Val Lys Lys
20 25 30

Gly Pro Trp Gln Thr Phe Cys Ala Ser Glu Trp Pro Thr Phe Asp Val
35 40 45

Gly Trp Pro Ser Glu Gly Thr Phe Asn Ser Glu Ile Ile Leu Ala Val
50 55 60

Lys Ala Ile Ile Phe Gln Thr Gly Pro Gly Ser His Pro Asp Gln Glu
 65 70 75 80
 Pro Tyr Ile Leu Thr Trp Gln Asp Leu Ala Glu Asp Pro Pro Pro Trp
 85 90 95
 Val Lys Pro Trp Leu Asn Lys Pro Arg Lys Pro Gly Pro Arg Ile Leu
 100 105 110
 Ala Leu Gly Glu Lys Asn Lys His Ser Ala Glu Lys Val Glu Pro Ser
 115 120 125
 Ser Ser Tyr Leu Pro Arg Asp Arg Gly Ala Ala Asp Leu Ala Gly Thr
 130 135 140
 Pro Thr Cys Ser Pro Thr Pro Leu Ser Ser Thr Gly Cys Cys Glu Gly
 145 150 155 160
 Thr Ser Ala Pro Pro Gly Ala Pro Val Val Glu Gly Pro Ala Ala Gly
 165 170 175
 Thr Arg Ser Arg Arg Gly Ala Thr Pro Glu Arg Thr Asp Glu Ile Ala
 180 185 190
 Ile Leu Pro Leu Arg Thr Tyr Gly Pro Pro Met Pro Gly Gly Gln Leu
 195 200 205
 Gln Pro Leu Gln Tyr Trp Pro Phe Ser Ser Ala Asp Leu Tyr Asn Trp
 210 215 220
 Lys Thr Asn His Pro Pro Phe Ser Glu Asp Pro Gln Arg Leu Thr Gly
 225 230 235 240
 Leu Val Glu Ser Leu Met Phe Ser His Gln Pro Thr Trp Asp Asp Cys
 245 250 255
 Gln Gln Leu Leu Gln Thr Leu Phe Thr Thr Glu Glu Arg Glu Arg Ile
 260 265 270
 Leu Leu Glu Ala Arg Lys Asn Val Pro Gly Ala Asp Gly Arg Pro Thr
 275 280 285
 Gln Leu Gln Asn Glu Ile Asp Met Gly Phe Pro Leu Thr Arg Pro Gly
 290 295 300
 Trp Asp Tyr Asn Thr Ala Glu Gly Arg Glu Ser Leu Lys Ile Tyr Arg
 305 310 315 320
 Gln Ala Leu Val Ala Gly Leu Arg Gly Ala Ser Arg Arg Pro Thr Asn
 325 330 335
 Leu Ala Lys Val Arg Glu Val Met Gln Gly Pro Asn Glu Pro Pro Ser
 340 345 350

Val Phe Leu Glu Arg Leu Met Glu Ala Phe Arg Arg Phe Thr Pro Phe
355 360 365

Asp Pro Thr Ser Glu Ala Gln Lys Ala Ser Val Ala Leu Ala Phe Ile
370 375 380

Gly Gln Ser Ala Leu Asp Ile Arg Lys Lys Leu Gln Arg Leu Glu Gly
385 390 395 400

Leu Gln Glu Ala Glu Leu Arg Asp Leu Val Arg Glu Ala Glu Lys Val
405 410 415

Tyr Tyr Arg Arg Glu Thr Glu Glu Glu Lys Glu Gln Arg Lys Glu Lys
420 425 430

Glu Arg Glu Glu Arg Glu Glu Arg Arg Asp Arg Arg Gln Glu Lys Asn
435 440 445

Leu Thr Lys Ile Leu Ala Ala Val Val Glu Gly Lys Ser Ser Arg Glu
450 455 460

Arg Glu Arg Asp Phe Arg Lys Ile Arg Ser Gly Pro Arg Gln Ser Gly
465 470 475 480

Asn Leu Gly Asn Arg Thr Pro Leu Asp Lys Asp Gln Cys Ala Tyr Cys
485 490 495

Lys Glu Lys Gly His Trp Ala Arg Asn Cys Pro Lys Lys Gly Asn Lys
500 505 510

Gly Pro Lys Val Leu Ala Leu Glu Glu Asp Lys Asp
515 520

<210> 2

<211> 660

<212> PRT

<213> porcine endogenous retrovirus Type PERV A

<400> 2

Met His Pro Thr Leu Ser Arg Arg His Leu Pro Ile Arg Gly Gly Lys
1 5 10 15

Pro Lys Arg Leu Lys Ile Pro Leu Ser Phe Ala Ser Ile Ala Trp Phe
20 25 30

Leu Thr Leu Ser Ile Thr Pro Gln Val Asn Gly Lys Arg Leu Val Asp
35 40 45

Ser Pro Asn Ser His Lys Pro Leu Ser Leu Thr Trp Leu Leu Thr Asp
 50 55 60

Ser Gly Thr Gly Ile Asn Ile Asn Ser Thr Gln Gly Glu Ala Pro Leu
 65 70 75 80

Gly Thr Trp Trp Pro Glu Leu Tyr Val Cys Leu Arg Ser Val Ile Pro
 85 90 95

Gly Leu Asn Asp Gln Ala Thr Pro Pro Asp Val Leu Arg Ala Tyr Gly
 100 105 110

Phe Tyr Val Cys Pro Gly Pro Pro Asn Asn Glu Glu Tyr Cys Gly Asn
 115 120 125

Pro Gln Asp Phe Phe Cys Lys Gln Trp Ser Cys Ile Thr Ser Asn Asp
 130 135 140

Gly Asn Trp Lys Trp Pro Val Ser Gln Gln Asp Arg Val Ser Tyr Ser
 145 150 155 160

Phe Val Asn Asn Pro Thr Ser Tyr Asn Gln Phe Asn Tyr Gly His Gly
 165 170 175

Arg Trp Lys Asp Trp Gln Gln Arg Val Gln Lys Asp Val Arg Asn Lys
 180 185 190

Gln Ile Ser Cys His Ser Leu Asp Leu Asp Tyr Leu Lys Ile Ser Phe
 195 200 205

Thr Glu Lys Gly Lys Gln Glu Asn Ile Gln Lys Trp Val Asn Gly Ile
 210 215 220

Ser Trp Gly Ile Val Tyr Tyr Gly Gly Ser Gly Arg Lys Lys Gly Ser
 225 230 235 240

Val Leu Thr Ile Arg Leu Arg Ile Glu Thr Gln Met Glu Pro Pro Val
 245 250 255

Ala Ile Gly Pro Asn Lys Gly Leu Ala Glu Gln Gly Pro Pro Ile Gln
 260 265 270

Glu Gln Arg Pro Ser Pro Asn Pro Ser Asp Tyr Asn Thr Thr Ser Gly
 275 280 285

Ser Val Pro Thr Glu Pro Asn Ile Thr Ile Lys Thr Gly Ala Lys Leu
 290 295 300

Phe Ser Leu Ile Gln Gly Ala Phe Gln Ala Leu Asn Ser Thr Thr Pro
 305 310 315 320

Glu Ala Thr Ser Ser Cys Trp Leu Cys Leu Ala Ser Gly Pro Pro Tyr
 325 330 335

Tyr Glu Gly Met Ala Arg Gly Gly Lys Phe Asn Val Thr Lys Glu His
340 345 350

Arg Asp Gln Cys Thr Trp Gly Ser Gln Asn Lys Leu Thr Leu Thr Glu
355 360 365

Val Ser Gly Lys Gly Thr Cys Ile Gly Met Val Pro Pro Ser His Gln
370 375 380

His Leu Cys Asn His Thr Glu Ala Phe Asn Arg Thr Ser Glu Ser Gln
385 390 395 400

Tyr Leu Val Pro Gly Tyr Asp Arg Trp Trp Ala Cys Asn Thr Gly Leu
405 410 415

Thr Pro Cys Val Ser Thr Leu Val Phe Asn Gln Thr Lys Asp Phe Cys
420 425 430

Val Met Val Gln Ile Val Pro Arg Val Tyr Tyr Tyr Pro Glu Lys Ala
435 440 445

Val Leu Asp Glu Tyr Asp Tyr Arg Tyr Asn Arg Pro Lys Arg Glu Pro
450 455 460

Ile Ser Leu Thr Leu Ala Val Met Leu Gly Leu Gly Val Ala Ala Gly
465 470 475 480

Val Gly Thr Gly Thr Ala Ala Leu Ile Thr Gly Pro Gln Gln Leu Glu
485 490 495

Lys Gly Leu Ser Asn Leu His Arg Ile Val Thr Glu Asp Leu Gln Ala
500 505 510

Leu Glu Lys Ser Val Ser Asn Leu Glu Glu Ser Leu Thr Ser Leu Ser
515 520 525

Glu Val Val Leu Gln Asn Arg Arg Gly Leu Asp Leu Leu Phe Leu Lys
530 535 540

Glu Gly Gly Leu Cys Val Ala Leu Lys Glu Glu Cys Cys Phe Tyr Val
545 550 555 560

Asp His Ser Gly Ala Ile Arg Asp Ser Met Ser Lys Leu Arg Glu Arg
565 570 575

Leu Glu Arg Arg Arg Arg Glu Arg Glu Ala Asp Gln Gly Trp Phe Glu
580 585 590

Gly Trp Phe Asn Arg Ser Pro Trp Met Thr Thr Leu Leu Ser Ala Leu
595 600 605

Thr Gly Pro Leu Val Val Leu Leu Leu Leu Thr Val Gly Pro Cys
610 615 620

Leu Ile Asn Arg Phe Val Ala Phe Val Arg Glu Arg Val Ser Ala Val
625 630 635 640

Gln Ile Met Val Leu Arg Gln Gln Tyr Gln Gly Leu Leu Ser Gln Gly
645 650 655

Glu Thr Asp Leu
660

<210> 3

<211> 638

<212> PRT

<213> porcine endogenous retrovirus Type PERV.MSL

<400> 3

Met His Pro Thr Leu Asn Arg Arg His Leu Pro Ile Arg Gly Gly Lys
1 5 10 15

Pro Lys Arg Leu Lys Ile Pro Leu Ser Phe Ala Ser Ile Ala Trp Phe
20 25 30

Leu Thr Leu Ser Ile Thr Ser Gln Thr Asn Gly Met Arg Ile Gly Asp
35 40 45

Ser Leu Asn Ser His Lys Pro Leu Ser Leu Thr Trp Leu Ile Thr Asp
50 55 60

Ser Gly Thr Gly Ile Asn Ile Asn Asn Thr Gln Gly Glu Ala Pro Leu
65 70 75 80

Gly Thr Trp Trp Pro Asp Leu Tyr Val Cys Leu Arg Ser Val Ile Pro
85 90 95

Ser Leu Thr Ser Pro Pro Asp Ile Leu His Ala His Gly Phe Tyr Val
100 105 110

Cys Pro Gly Pro Pro Asn Asn Gly Lys His Cys Gly Asn Pro Arg Asp
115 120 125

Phe Phe Cys Lys Gln Trp Asn Cys Val Thr Ser Asn Asp Gly Tyr Trp
130 135 140

Lys Trp Pro Thr Ser Gln Gln Asp Arg Val Ser Phe Ser Tyr Val Asn
145 150 155 160

Thr Tyr Thr Ser Ser Gly Gln Phe Asn Tyr Leu Thr Trp Ile Arg Thr
165 170 175

Gly Ser Pro Lys Cys Ser Pro Ser Asp Leu Asp Tyr Leu Lys Ile Ser
 180 185 190

Phe Thr Glu Lys Gly Lys Gln Glu Asn Ile Leu Lys Trp Val Asn Gly
 195 200 205

Met Ser Trp Gly Met Val Tyr Tyr Gly Gly Ser Gly Lys Gln Pro Gly
 210 215 220

Ser Ile Leu Thr Ile Arg Leu Lys Ile Asn Gln Leu Glu Pro Pro Met
 225 230 235 240

Ala Ile Gly Pro Asn Thr Val Leu Thr Gly Gln Arg Pro Pro Thr Gln
 245 250 255

Gly Pro Gly Pro Ser Ser Asn Ile Thr Ser Gly Ser Asp Pro Thr Glu
 260 265 270

Ser Asn Ser Thr Thr Lys Met Gly Ala Lys Leu Phe Ser Leu Ile Gln
 275 280 285

Gly Ala Phe Gln Ala Leu Asn Ser Thr Thr Pro Glu Ala Thr Ser Ser
 290 295 300

Cys Trp Leu Cys Leu Ala Ser Gly Pro Pro Tyr Tyr Glu Gly Met Ala
 305 310 315 320

Arg Arg Gly Lys Phe Asn Val Thr Lys Glu His Arg Asp Gln Cys Thr
 325 330 335

Trp Gly Ser Gln Asn Lys Leu Thr Leu Thr Glu Val Ser Gly Lys Gly
 340 345 350

Thr Cys Ile Gly Lys Val Pro Pro Ser His Gln His Leu Cys Asn His
 355 360 365

Thr Glu Ala Phe Asn Gln Thr Ser Glu Ser Gln Tyr Leu Val Pro Gly
 370 375 380

Tyr Asp Arg Trp Trp Ala Cys Asn Thr Gly Leu Thr Pro Cys Val Ser
 385 390 395 400

Thr Leu Val Phe Asn Gln Thr Lys Asp Phe Cys Ile Met Val Gln Ile
 405 410 415

Val Pro Arg Val Tyr Tyr Tyr Pro Glu Lys Ala Ile Leu Asp Glu Tyr
 420 425 430

Asp Tyr Arg Asn His Arg Gln Lys Arg Glu Pro Ile Ser Leu Thr Leu
 435 440 445

Ala Val Met Leu Gly Leu Gly Val Ala Ala Gly Val Gly Thr Gly Thr
450 455 460

Ala Ala Leu Val Thr Gly Pro Gln Gln Leu Glu Thr Gly Leu Ser Asn
465 470 475 480

Leu His Arg Ile Val Thr Glu Asp Leu Gln Ala Leu Glu Lys Ser Val
485 490 495

Ser Asn Leu Glu Glu Ser Leu Thr Ser Leu Ser Glu Val Val Leu Gln
500 505 510

Asn Arg Arg Gly Leu Asp Leu Leu Phe Leu Lys Glu Gly Gly Leu Cys
515 520 525

Val Ala Leu Lys Glu Glu Cys Cys Phe Tyr Val Asp His Ser Gly Ala
530 535 540

Ile Arg Asp Ser Met Asn Lys Leu Arg Glu Arg Leu Glu Lys Arg Arg
545 550 555 560

Arg Glu Lys Glu Thr Thr Gln Gly Trp Phe Glu Gly Trp Phe Asn Arg
565 570 575

Ser Leu Trp Leu Ala Thr Leu Leu Ser Ala Leu Thr Gly Pro Leu Ile
580 585 590

Val Leu Leu Leu Leu Thr Val Gly Pro Cys Ile Ile Asn Lys Leu
595 600 605

Ile Ala Phe Ile Arg Glu Arg Ile Ser Ala Val Gln Ile Met Val Leu
610 615 620

Arg Gln Gln Tyr Gln Ser Pro Ser Ser Arg Glu Ala Gly Arg
625 630 635

<210> 4

<211> 638

<212> PRT

<213> porcine endogenous retrovirus Type Tsukuba

<400> 4

Met His Pro Thr Leu Ser Arg Arg His Leu Pro Ile Arg Gly Gly Lys
1 5 10 15

Pro Lys Arg Leu Lys Ile Pro Leu Ser Phe Ala Ser Ile Ala Trp Phe
20 25 30

Leu Thr Leu Ser Ile Thr Ser Gln Thr Asn Gly Met Arg Ile Gly Asp
35 40 45

Ser Leu Asn Ser His Lys Pro Leu Ser Leu Thr Trp Leu Ile Thr Asp
50 55 60

Ser Gly Thr Gly Ile Asn Ile Asn Asn Thr Gln Gly Glu Ala Pro Leu
65 70 75 80

Gly Thr Trp Trp Pro Asp Leu Tyr Val Cys Leu Arg Ser Val Ile Pro
85 90 95

Ser Leu Thr Ser Pro Pro Asp Ile Leu His Ala His Gly Phe Tyr Val
100 105 110

Cys Pro Gly Pro Pro Asn Asn Gly Lys His Cys Gly Asn Pro Arg Asp
115 120 125

Phe Phe Cys Lys Gln Trp Asn Cys Val Thr Ser Asn Asp Gly Tyr Trp
130 135 140

Lys Trp Pro Thr Ser Gln Gln Asp Arg Val Ser Phe Ser Tyr Val Asn
145 150 155 160

Thr Tyr Thr Ser Ser Gly Gln Phe Asn Tyr Leu Thr Trp Ile Arg Thr
165 170 175

Gly Ser Pro Lys Cys Ser Pro Ser Asp Leu Asp Tyr Leu Lys Ile Ser
180 185 190

Phe Thr Glu Lys Gly Lys Gln Glu Asn Ile Leu Lys Trp Val Asn Gly
195 200 205

Met Ser Trp Gly Met Val Tyr Tyr Gly Gly Ser Gly Lys Gln Pro Gly
210 215 220

Ser Ile Leu Thr Ile Arg Leu Lys Ile Asn Gln Leu Glu Pro Pro Met
225 230 235 240

Ala Ile Gly Pro Asn Thr Val Leu Thr Gly Gln Arg Pro Pro Thr Gln
245 250 255

Gly Pro Gly Pro Ser Ser Asn Ile Thr Ser Gly Ser Asp Pro Thr Glu
260 265 270

Ser Ser Ser Thr Thr Lys Met Gly Ala Lys Leu Phe Ser Leu Ile Gln
275 280 285

Gly Ala Phe Gln Ala Leu Asn Ser Thr Thr Pro Glu Ala Thr Ser Ser
290 295 300

Cys Trp Leu Cys Leu Ala Leu Gly Pro Pro Tyr Tyr Glu Gly Met Ala
305 310 315 320

Arg Arg Gly Lys Phe Asn Val Thr Lys Glu His Arg Asp Gln Cys Thr
 325 330 335
 Trp Gly Ser Gln Asn Lys Leu Thr Leu Thr Glu Val Ser Gly Lys Gly
 340 345 350
 Thr Cys Ile Gly Lys Val Pro Pro Ser His Gln His Leu Cys Asn His
 355 360 365
 Thr Glu Ala Phe Asn Gln Thr Ser Glu Ser Gln Tyr Leu Val Pro Gly
 370 375 380
 Tyr Asp Arg Trp Trp Ala Cys Asn Thr Gly Leu Thr Pro Cys Val Ser
 385 390 395 400
 Thr Leu Val Phe Asn Gln Thr Lys Asp Phe Cys Ile Met Val Gln Ile
 405 410 415
 Val Pro Arg Val Tyr Tyr Tyr Pro Glu Lys Ala Ile Leu Asp Glu Tyr
 420 425 430
 Asp Tyr Arg Asn His Arg Gln Lys Arg Glu Pro Ile Ser Leu Thr Leu
 435 440 445
 Ala Val Met Leu Gly Leu Gly Val Ala Ala Gly Val Gly Thr Gly Thr
 450 455 460
 Ala Ala Leu Val Thr Gly Pro Gln Gln Leu Glu Thr Gly Leu Ser Asn
 465 470 475 480
 Leu His Arg Ile Val Thr Glu Asp Leu Gln Ala Leu Glu Lys Ser Val
 485 490 495
 Ser Asn Leu Glu Glu Ser Leu Thr Ser Leu Ser Glu Val Val Leu Gln
 500 505 510
 Asn Arg Arg Gly Leu Asp Leu Leu Phe Leu Lys Glu Gly Gly Leu Cys
 515 520 525
 Val Ala Leu Lys Glu Glu Cys Cys Phe Tyr Val Asp His Ser Gly Ala
 530 535 540
 Ile Arg Asp Ser Met Asn Lys Leu Arg Glu Arg Leu Glu Lys Arg Arg
 545 550 555 560
 Arg Glu Lys Glu Thr Thr Gln Gly Trp Phe Glu Gly Trp Phe Asn Arg
 565 570 575
 Ser Pro Trp Leu Ala Thr Leu Leu Ser Ala Leu Thr Gly Pro Leu Ile
 580 585 590
 Val Leu Leu Leu Leu Thr Val Gly Pro Cys Ile Ile Asn Lys Leu
 595 600 605

Ile Ala Phe Ile Arg Glu Arg Ile Ser Ala Val Gln Ile Met Val Leu
610 615 620

Arg Gln Gln Tyr Gln Ser Pro Ser Ser Arg Glu Ala Gly Arg
625 630 635

<210> 5

<211> 657

<212> PRT

<213> porcine endogenous retrovirus Type PERV B

<400> 5

Met His Pro Thr Leu Ser Trp Arg His Leu Pro Thr Arg Gly Gly Glu
1 5 10 15

Pro Lys Arg Leu Arg Ile Pro Leu Ser Phe Ala Ser Ile Ala Trp Phe
20 25 30

Leu Thr Leu Thr Ile Thr Pro Gln Ala Ser Ser Lys Arg Leu Ile Asp
35 40 45

Ser Ser Asn Pro His Arg Pro Leu Ser Leu Thr Trp Leu Ile Ile Asp
50 55 60

Pro Asp Thr Gly Val Thr Val Asn Ser Thr Arg Gly Val Ala Pro Arg
65 70 75 80

Gly Thr Trp Trp Pro Glu Leu His Phe Cys Leu Arg Leu Ile Asn Pro
85 90 95

Ala Val Lys Ser Thr Pro Pro Asn Leu Val Arg Ser Tyr Gly Phe Tyr
100 105 110

Cys Cys Pro Gly Thr Glu Lys Glu Lys Tyr Cys Gly Gly Ser Gly Glu
115 120 125

Ser Phe Cys Arg Arg Trp Ser Cys Val Thr Ser Asn Asp Gly Asp Trp
130 135 140

Lys Trp Pro Ile Ser Leu Gln Asp Arg Val Lys Phe Ser Phe Val Asn
145 150 155 160

Ser Gly Pro Gly Lys Tyr Lys Val Met Lys Leu Tyr Lys Asp Lys Ser
165 170 175

Cys Ser Pro Ser Asp Leu Asp Tyr Leu Lys Ile Ser Phe Thr Glu Lys
180 185 190

Gly Lys Gln Glu Asn Ile Gln Lys Trp Ile Asn Gly Met Ser Trp Gly
195 200 205

Ile Val Phe Tyr Lys Tyr Gly Gly Gly Ala Gly Ser Thr Leu Thr Ile
210 215 220

Arg Leu Arg Ile Glu Thr Gly Thr Glu Pro Pro Val Ala Val Gly Pro
225 230 235 240

Asp Lys Val Leu Ala Glu Gln Gly Pro Pro Ala Leu Glu Pro Pro His
245 250 255

Asn Leu Pro Val Pro Gln Leu Thr Ser Leu Arg Pro Asp Ile Thr Gln
260 265 270

Pro Pro Ser Asn Gly Thr Thr Gly Leu Ile Pro Thr Asn Thr Pro Arg
275 280 285

Asn Ser Pro Gly Val Pro Val Lys Thr Gly Gln Arg Leu Phe Ser Leu
290 295 300

Ile Gln Gly Ala Phe Gln Ala Ile Asn Ser Thr Asp Pro Asp Ala Thr
305 310 315 320

Ser Ser Cys Trp Leu Cys Leu Ser Ser Gly Pro Pro Tyr Tyr Glu Gly
325 330 335

Met Ala Lys Glu Gly Lys Phe Asn Val Thr Lys Glu His Arg Asn Gln
340 345 350

Cys Thr Trp Gly Ser Arg Asn Lys Leu Thr Leu Thr Glu Val Ser Gly
355 360 365

Lys Gly Thr Cys Ile Gly Lys Ala Pro Pro Ser His Gln His Leu Cys
370 375 380

Tyr Ser Thr Val Val Tyr Glu Gln Ala Ser Glu Asn Gln Tyr Leu Val
385 390 395 400

Pro Gly Tyr Asn Arg Trp Trp Ala Cys Asn Thr Gly Leu Thr Pro Cys
405 410 415

Val Ser Thr Ser Val Phe Asn Gln Ser Lys Asp Phe Cys Val Met Val
420 425 430

Gln Ile Val Pro Arg Val Tyr Tyr His Pro Glu Glu Val Val Leu Asp
435 440 445

Glu Tyr Asp Tyr Arg Tyr Asn Arg Pro Lys Arg Glu Pro Val Ser Leu
450 455 460

Thr Leu Ala Val Met Leu Gly Leu Gly Thr Ala Val Gly Val Gly Thr
465 470 475 480

Gly Thr Ala Ala Leu Ile Thr Gly Pro Gln Gln Leu Glu Lys Gly Leu
 485 490 495
 Gly Glu Leu His Ala Ala Met Thr Glu Asp Leu Arg Ala Leu Glu Glu
 500 505 510
 Ser Val Ser Asn Leu Glu Glu Ser Leu Thr Ser Leu Ser Glu Val Val
 515 520 525
 Leu Gln Asn Arg Arg Gly Leu Asp Leu Leu Phe Leu Arg Glu Gly Gly
 530 535 540
 Leu Cys Ala Ala Leu Lys Glu Glu Cys Cys Phe Tyr Val Asp His Ser
 545 550 555 560
 Gly Ala Ile Arg Asp Ser Met Ser Lys Leu Arg Glu Arg Leu Glu Arg
 565 570 575
 Arg Arg Arg Glu Arg Glu Ala Asp Gln Gly Trp Phe Glu Gly Trp Phe
 580 585 590
 Asn Arg Ser Pro Trp Met Thr Thr Leu Leu Ser Ala Leu Thr Gly Pro
 595 600 605
 Leu Val Val Leu Leu Leu Leu Leu Thr Val Gly Pro Cys Leu Ile Asn
 610 615 620
 Arg Phe Val Ala Phe Val Arg Glu Arg Val Ser Ala Val Gln Ile Met
 625 630 635 640
 Val Leu Arg Gln Gln Tyr Gln Gly Leu Leu Ser Gln Gly Glu Thr Asp
 645 650 655
 Leu

<210> 6

<211> 656

<212> PRT

<213> porcine endogenous retrovirus Type PoEV1

<400> 6

Met His Pro Thr Leu Ser Arg Arg His Leu Pro Thr Arg Gly Gly Glu
 1 5 10 15
 Pro Lys Arg Leu Arg Ile Pro Leu Ser Phe Ala Ser Ile Ala Trp Phe
 20 25 30

Leu Thr Leu Thr Ile Thr Pro Gln Ala Ser Ser Lys Arg Leu Ile Asp
 35 40 45
 Ser Ser Asn Pro His Arg Pro Leu Ser Leu Thr Trp Leu Ile Ile Asp
 50 55 60
 Pro Asp Thr Gly Val Thr Val Asn Ser Thr Arg Gly Val Ala Pro Arg
 65 70 75 80
 Gly Thr Trp Trp Pro Glu Leu His Phe Cys Leu Arg Leu Ile Asn Pro
 85 90 95
 Ala Val Lys Ser Thr Pro Pro Asn Leu Val Arg Ser Tyr Gly Phe Tyr
 100 105 110
 Cys Cys Pro Gly Thr Glu Lys Glu Lys Tyr Cys Gly Gly Ser Gly Glu
 115 120 125
 Ser Phe Cys Arg Arg Trp Ser Cys Val Thr Ser Asn Asp Gly Asp Trp
 130 135 140
 Lys Trp Pro Ile Ser Leu Gln Asp Arg Val Lys Phe Ser Phe Val Asn
 145 150 155 160
 Ser Gly Pro Gly Lys Tyr Lys Met Met Lys Leu Tyr Lys Asp Lys Ser
 165 170 175
 Cys Ser Pro Ser Asp Leu Asp Tyr Leu Lys Ile Ser Phe Thr Glu Arg
 180 185 190
 Lys Thr Gly Lys Tyr Ser Lys Val Asp Lys Trp Tyr Glu Leu Gly Asn
 195 200 205
 Ser Phe Leu Leu Tyr Gly Gly Gly Ala Gly Ser Thr Leu Thr Ile Arg
 210 215 220
 Leu Arg Ile Glu Thr Gly Thr Glu Pro Pro Val Ala Met Gly Pro Asp
 225 230 235 240
 Lys Val Leu Ala Glu Gln Gly Pro Pro Ala Leu Glu Pro Pro His Asn
 245 250 255
 Leu Pro Val Pro Gln Leu Thr Ser Leu Arg Pro Asp Ile Thr Gln Pro
 260 265 270
 Pro Ser Asn Ser Thr Thr Gly Leu Ile Pro Thr Asn Thr Pro Arg Asn
 275 280 285
 Ser Pro Gly Val Pro Val Lys Thr Gly Gln Arg Leu Phe Ser Leu Ile
 290 295 300
 Gln Gly Ala Phe Gln Ala Ile Asn Ser Thr Asp Pro Asp Ala Thr Ser
 305 310 315 320

Ser Cys Trp Leu Cys₃₂₅ Leu Ser Ser Gly₃₃₀ Pro Pro Tyr Tyr Glu Gly₃₃₅ Met

Ala Lys Glu Arg₃₄₀ Lys Phe Asn Val Thr₃₄₅ Lys Glu His Arg Asn₃₅₀ Gln Cys

Thr Trp Gly₃₅₅ Ser Arg Asn Lys₃₆₀ Leu Thr Leu Thr Glu Val₃₆₅ Ser Gly Lys

Gly Thr Cys Ile Gly Lys Ala₃₇₅ Pro Pro Ser His₃₈₀ Gln His Leu Cys Tyr

Ser Thr Val Val Tyr Glu₃₉₀ Gln Ala Ser Glu Asn₃₉₅ Gln Tyr Leu Val Pro₄₀₀

Gly Tyr Asn Arg Trp₄₀₅ Trp Ala Cys Asn Thr₄₁₀ Gly Leu Thr Pro Cys₄₁₅ Val

Ser Thr Ser Val₄₂₀ Phe Asn Gln Ser Lys₄₂₅ Asp Phe Cys Val₄₃₀ Met Val Gln

Ile Val Pro Arg Val Tyr Tyr His₄₄₀ Pro Glu Glu Val₄₄₅ Val Leu Asp Glu

Tyr Asp Tyr Arg Tyr Asn Arg₄₅₅ Pro Lys Arg Glu Pro₄₆₀ Val Ser Leu Thr

Leu Ala Val Met Leu Gly₄₇₀ Leu Gly Thr Ala Val₄₇₅ Gly Val Gly Thr Gly₄₈₀

Thr Ala Ala Leu Ile₄₈₅ Thr Gly Pro Gln Gln₄₉₀ Leu Glu Lys Gly Leu₄₉₅ Gly

Glu Leu His Ala₅₀₀ Ala Met Thr Glu Asp₅₀₅ Leu Arg Ala Leu Lys₅₁₀ Glu Ser

Val Ser Asn₅₁₅ Leu Glu Glu Ser Leu₅₂₀ Thr Ser Leu Ser Glu₅₂₅ Val Val Leu

Gln Asn₅₃₀ Arg Arg Gly Leu Asp₅₃₅ Leu Leu Phe Leu Arg₅₄₀ Glu Gly Gly Leu

Cys Ala Ala Leu Lys Glu₅₅₀ Glu Cys Cys Phe Tyr₅₅₅ Val Asp His Ser Gly₅₆₀

Ala Ile Arg Asp Ser₅₆₅ Met Asn Lys Leu Arg₅₇₀ Lys Lys Leu Glu Arg₅₇₅ Arg

Arg Arg Glu Arg₅₈₀ Glu Ala Asp Gln Gly₅₈₅ Trp Phe Glu Gly Trp₅₉₀ Phe Asn

Arg Ser Pro Trp Met Thr Thr Leu Leu Ser Ala Leu Thr Gly Pro Leu
595 600 605

Val Val Leu Leu Leu Leu Leu Thr Val Gly Pro Cys Leu Ile Asn Arg
610 615 620

Phe Val Ala Phe Val Arg Glu Arg Val Ser Ala Val Gln Ile Met Val
625 630 635 640

Leu Arg Gln Gln Tyr Gln Gly Leu Leu Ser Gln Gly Glu Thr Asp Leu
645 650 655

<210> 7

<211> 221

<212> PRT

<213> porcine endogenous retrovirus Type PERV A

<400> 7

Asn Asn Glu Glu Tyr Cys Gly Asn Pro Gln Asp Phe Phe Cys Lys Gln
1 5 10 15

Trp Ser Cys Ile Thr Ser Asn Asp Gly Asn Trp Lys Trp Pro Val Ser
20 25 30

Gln Gln Asp Arg Val Ser Tyr Ser Phe Val Asn Asn Pro Thr Ser Tyr
35 40 45

Asn Gln Phe Asn Tyr Gly His Gly Arg Trp Lys Asp Trp Gln Gln Arg
50 55 60

Val Gln Lys Asp Val Arg Asn Lys Gln Ile Ser Cys His Ser Leu Asp
65 70 75 80

Leu Asp Tyr Leu Lys Ile Ser Phe Thr Glu Lys Gly Lys Gln Glu Asn
85 90 95

Ile Gln Lys Trp Val Asn Gly Ile Ser Trp Gly Ile Val Tyr Tyr Gly
100 105 110

Gly Ser Gly Arg Lys Lys Gly Ser Val Leu Thr Ile Arg Leu Arg Ile
115 120 125

Glu Thr Gln Met Glu Pro Pro Val Ala Ile Gly Pro Asn Lys Gly Leu
130 135 140

Ala Glu Gln Gly Pro Pro Ile Gln Glu Gln Arg Pro Ser Pro Asn Pro
145 150 155 160

Ser Asp Tyr Asn Thr Thr Ser Gly Ser Val Pro Thr Glu Pro Asn Ile
165 170 175

Thr Ile Lys Thr Gly Ala Lys Leu Phe Ser Leu Ile Gln Gly Ala Phe
180 185 190

Gln Ala Leu Asn Ser Thr Thr Pro Glu Ala Thr Ser Ser Cys Trp Leu
195 200 205

Cys Leu Ala Ser Gly Pro Pro Tyr Tyr Glu Gly Met Ala
210 215 220

<210> 8

<211> 203

<212> PRT

<213> porcine endogenous retrovirus Type PERV MSL

<400> 8

Asn Asn Gly Lys His Cys Gly Asn Pro Arg Asp Phe Phe Cys Lys Gln
1 5 10 15

Trp Asn Cys Val Thr Ser Asn Asp Gly Tyr Trp Lys Trp Pro Thr Ser
20 25 30

Gln Gln Asp Arg Val Ser Phe Ser Tyr Val Asn Thr Tyr Thr Ser Ser
35 40 45

Gly Gln Phe Asn Tyr Leu Thr Trp Ile Arg Thr Gly Ser Pro Lys Cys
50 55 60

Ser Pro Ser Asp Leu Asp Tyr Leu Lys Ile Ser Phe Thr Glu Lys Gly
65 70 75 80

Lys Gln Glu Asn Ile Leu Lys Trp Val Asn Gly Met Ser Trp Gly Met
85 90 95

Val Tyr Tyr Gly Gly Ser Gly Lys Gln Pro Gly Ser Ile Leu Thr Ile
100 105 110

Arg Leu Lys Ile Asn Gln Leu Glu Pro Pro Met Ala Ile Gly Pro Asn
115 120 125

Thr Val Leu Thr Gly Gln Arg Pro Pro Thr Gln Gly Pro Gly Pro Ser
130 135 140

Ser Asn Ile Thr Ser Gly Ser Asp Pro Thr Glu Ser Asn Ser Thr Thr
145 150 155 160

Lys Met Gly Ala Lys Leu Phe Ser Leu Ile Gln Gly Ala Phe Gln Ala
165 170 175

Leu Asn Ser Thr Thr Pro Glu Ala Thr Ser Ser Cys Trp Leu Cys Leu
180 185 190

Ala Ser Gly Pro Pro Tyr Tyr Glu Gly Met Ala
195 200

<210> 9

<211> 203

<212> PRT

<213> porcine endogenous retrovirus Type Tsukuba

<400> 9

Asn Asn Gly Lys His Cys Gly Asn Pro Arg Asp Phe Phe Cys Lys Gln
1 5 10 15

Trp Asn Cys Val Thr Ser Asn Asp Gly Tyr Trp Lys Trp Pro Thr Ser
20 25 30

Gln Gln Asp Arg Val Ser Phe Ser Tyr Val Asn Thr Tyr Thr Ser Ser
35 40 45

Gly Gln Phe Asn Tyr Leu Thr Trp Ile Arg Thr Gly Ser Pro Lys Cys
50 55 60

Ser Pro Ser Asp Leu Asp Tyr Leu Lys Ile Ser Phe Thr Glu Lys Gly
65 70 75 80

Lys Gln Glu Asn Ile Leu Lys Trp Val Asn Gly Met Ser Trp Gly Met
85 90 95

Val Tyr Tyr Gly Gly Ser Gly Lys Gln Pro Gly Ser Ile Leu Thr Ile
100 105 110

Arg Leu Lys Ile Asn Gln Leu Glu Pro Pro Met Ala Ile Gly Pro Asn
115 120 125

Thr Val Leu Thr Gly Gln Arg Pro Pro Thr Gln Gly Pro Gly Pro Ser
130 135 140

Ser Asn Ile Thr Ser Gly Ser Asp Pro Thr Glu Ser Ser Ser Thr Thr
145 150 155 160

Lys Met Gly Ala Lys Leu Phe Ser Leu Ile Gln Gly Ala Phe Gln Ala
165 170 175

Leu Asn Ser Thr Thr Pro Glu Ala Thr Ser Ser Cys Trp Leu Cys Leu
180 185 190

Ala Leu Gly Pro Pro Tyr Tyr Glu Gly Met Ala
195 200

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<212> PRT
<213> porcine endogenous retrovirus Type PERV B

<400> 10

Glu Lys Glu Lys Tyr Cys Gly Gly Ser Gly Glu Ser Phe Cys Arg Arg
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Trp Ser Cys Val Thr Ser Asn Asp Gly Asp Trp Lys Trp Pro Ile Ser
20 25 30
Leu Gln Asp Arg Val Lys Phe Ser Phe Val Asn Ser Gly Pro Gly Lys
35 40 45
Tyr Lys Val Met Lys Leu Tyr Lys Asp Lys Ser Cys Ser Pro Ser Asp
50 55 60
Leu Asp Tyr Leu Lys Ile Ser Phe Thr Glu Lys Gly Lys Gln Glu Asn
65 70 75 80
Ile Gln Lys Trp Ile Asn Gly Met Ser Trp Gly Ile Val Phe Tyr Lys
85 90 95
Tyr Gly Gly Gly Ala Gly Ser Thr Leu Thr Ile Arg Leu Arg Ile Glu
100 105 110
Thr Gly Thr Glu Pro Pro Val Ala Val Gly Pro Asp Lys Val Leu Ala
115 120 125
Glu Gln Gly Pro Pro Ala Leu Glu Pro Pro His Asn Leu Pro Val Pro
130 135 140
Gln Leu Thr Ser Leu Arg Pro Asp Ile Thr Gln Pro Pro Ser Asn Gly
145 150 155 160
Thr Thr Gly Leu Ile Pro Thr Asn Thr Pro Arg Asn Ser Pro Gly Val
165 170 175
Pro Val Lys Thr Gly Gln Arg Leu Phe Ser Leu Ile Gln Gly Ala Phe
180 185 190
Gln Ala Ile Asn Ser Thr Asp Pro Asp Ala Thr Ser Ser Cys Trp Leu
195 200 205
Cys Leu Ser Ser Gly Pro Pro Tyr Tyr Glu Gly Met Ala
210 215 220

<210> 11
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 <212> .PRT
 <213> porcine endogenous retrovirus Type PoEV1

<400> 11

Glu Lys Glu Lys Tyr Cys Gly Gly Ser Gly Glu Ser Phe Cys Arg Arg
 1 5 10 15
 Trp Ser Cys Val Thr Ser Asn Asp Gly Asp Trp Lys Trp Pro Ile Ser
 20 25 30
 Leu Gln Asp Arg Val Lys Phe Ser Phe Val Asn Ser Gly Pro Gly Lys
 35 40 45
 Tyr Lys Met Met Lys Leu Tyr Lys Asp Lys Ser Cys Ser Pro Ser Asp
 50 55 60
 Leu Asp Tyr Leu Lys Ile Ser Phe Thr Glu Arg Lys Thr Gly Lys Tyr
 65 70 75 80
 Ser Lys Val Asp Lys Trp Tyr Glu Leu Gly Asn Ser Phe Leu Leu Tyr
 85 90 95
 Gly Gly Gly Ala Gly Ser Thr Leu Thr Ile Arg Leu Arg Ile Glu Thr
 100 105 110
 Gly Thr Glu Pro Pro Val Ala Met Gly Pro Asp Lys Val Leu Ala Glu
 115 120 125
 Gln Gly Pro Pro Ala Leu Glu Pro Pro His Asn Leu Pro Val Pro Gln
 130 135 140
 Leu Thr Ser Leu Arg Pro Asp Ile Thr Gln Pro Pro Ser Asn Ser Thr
 145 150 155 160
 Thr Gly Leu Ile Pro Thr Asn Thr Pro Arg Asn Ser Pro Gly Val Pro
 165 170 175
 Val Lys Thr Gly Gln Arg Leu Phe Ser Leu Ile Gln Gly Ala Phe Gln
 180 185 190
 Ala Ile Asn Ser Thr Asp Pro Asp Ala Thr Ser Ser Cys Trp Leu Cys
 195 200 205
 Leu Ser Ser Gly Pro Pro Tyr Tyr Glu Gly Met Ala
 210 215 220

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<211> 15

<212> PRT

<213> porcine endogenous retrovirus

<400> 12

Arg Glu Glu Arg Arg Asp Arg Arg Gln Glu Lys Asn Leu Thr Lys
1 5 10 15

<210> 13

<211> 14

<212> PRT

<213> porcine endogenous retrovirus

<400> 13

Ala Arg Asn Cys Pro Lys Lys Gly Asn Lys Gly Pro Lys Val
1 5 10

<210> 14

<211> 16

<212> PRT

<213> porcine endogenous retrovirus Type PoEV1

<400> 14

Thr Ser Leu Arg Pro Asp Ile Thr Gln Pro Pro Ser Asn Ser Thr Thr
1 5 10 15

<210> 15

<211> 15

<212> PRT

<213> porcine endogenous retrovirus Type PERV B

<400> 15

Lys Gly Lys Gln Glu Asn Ile Gln Lys Trp Ile Asn Gly Met Ser
1 5 10 15

<210> 16

<211> 18

<212> PRT

<213> porcine endogenous retrovirus Type PoEV1

<400> 16

Arg Lys Thr Gly Lys Tyr Ser Lys Val Asp Lys Trp Tyr Glu Leu Gly
1 5 10 15

Asn Ser

<210> 17

<211> 12

<212> PRT

<213> porcine endogenous retrovirus Type Tsukuba

<400> 17

Asn Thr Val Leu Thr Gly Gln Arg Pro Pro Thr Gln
1 5 10

<210> 18

<211> 22

<212> PRT

<213> porcine endogenous retrovirus Type PERV A

<400> 18

Gly His Gly Arg Trp Lys Asp Trp Gln Gln Arg Val Gln Lys Asp Val
1 5 10 15

Arg Asn Lys Gln Ile Ser
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<210> 19

<211> 16

<212> PRT

<213> porcine endogenous retrovirus Type PERV A

<400> 19

Ile Gln Glu Gln Arg Pro Ser Pro Asn Pro Ser Asp Tyr Asn Thr Thr
1 5 10 15